

Adaptive Liners for Broadband Noise Reduction, Phase II

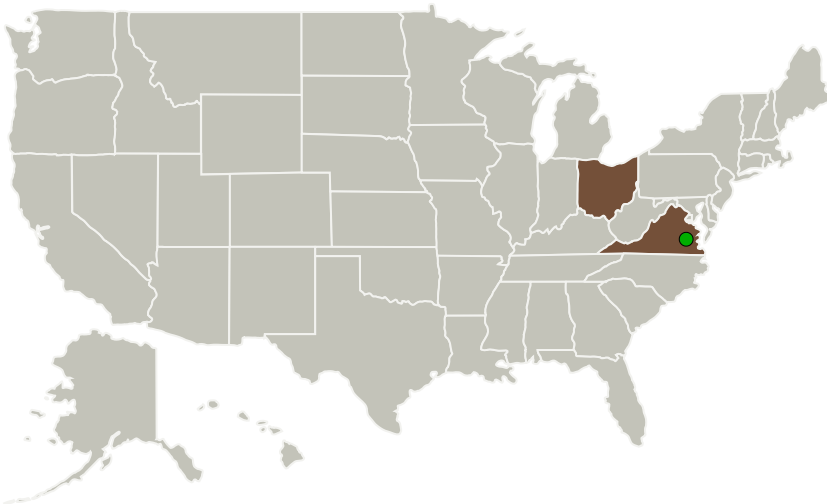
Completed Technology Project (2015 - 2017)



Project Introduction

This project will combine the advantages of adaptive materials with the simplistic passive design of state-of-the-art acoustic liners to provide the ability to tune them for specific operational frequencies (ex. take-off/cutback, cruise, and approach). Many proposed solutions are not practical from a manufacturing/cost perspective: too complex or add weight to the aircraft that is not justifiable. The requirements for aircraft noise are becoming more stringent with greater emphasis on improvements in performance efficiency and lower fuel consumption. CRG has demonstrated feasibility in implementing adaptive technologies into acoustic liners. The next step is to develop increased understanding at more relevant size scales to demonstrate repeatable liner control performance supported by more extensive acoustic testing runs to understand the initial shifting and increased suppression behaviors that have been observed. Automated cyclic testing of a given adaptive liner parameter will be executed on the order of hundreds of thousands of times to demonstrate the durability of the adaptive material for this application. CRG has focused adaptive liner design on demonstration of tuning reactance to TRL 3-4 in Phase I. CRG will develop multiple integrated prototype demonstrators with flow duct testing to achieve a TRL 5-6 at the end of Phase II.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Ohio	Virginia

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jason Hermiller

Co-Investigator:

Jason Hermiller

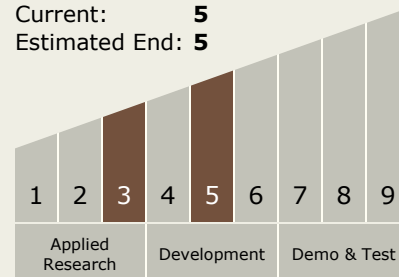
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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.4 Aeroacoustics

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System